

Appendix B

2011 Vegetation Monitoring Program Observation Monitoring Sites and Livestock Grazing Summary for the Kern Water Bank



Great Blue Heron (*Ardea herodias*)

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SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

svb
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May 23, 2012

2011 VEGETATION MONITORING PROGRAM
OBSERVATION MONITORING SITES AND LIVESTOCK GRAZING SUMMARY
for the
KERN WATER BANK

Submitted to:

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Vegetation Monitoring Program Observation Monitoring Sites and Livestock Grazing Summary

The Kern Water Bank (KWB) vegetation monitoring program consists of eight permanently established vegetation monitoring sites (OMS), each one located in a representative habitat on the KWB (e.g., canal, ditch, pond, uplands, old farm lands, and conservation lands). The locations of monitoring sites have been unchanged since their establishment in the late 1990's. Their locations are indicated in Figure 1. The primary purpose of monitoring these sites is to provide a qualitative evaluation and documentation of the dynamic nature of the vegetation on the KWB. Data collected and observations made at the monitoring sites are used to help guide vegetation management decisions, particularly in regards to livestock grazing strategies, and to facilitate the application of successful adaptive management strategies for the KWB.

All eight of the vegetation monitoring sites are visited each quarter by two biologists. The biologists collect data such as the observed plant and animal species, some basic weather conditions, general vegetation conditions, and other pertinent information. Lastly, photographs from all four cardinal directions (North, East, West, and South) are taken to provide a visual representation of the conditions encountered at each site. This approach has resulted in many years of successive photographic data that show the dynamic conditions of the vegetation on the KWB.

Rainfall during the 2011 rain year (October 1, 2010 - September 30, 2011) for the KWB was approximately 10.33 inches (159% of normal). This resulted in significant primary production of herbaceous vegetation throughout much of the KWB. Livestock grazing (cattle) was used throughout the entire 2011 season to help control the abundant growth of the annual herbaceous species and attempt to provide more suitable conditions for both predator and prey species to utilize the KWB Compatible Habitat areas, Conservation Bank, and Mitigation Lands. Additionally, recharge was in nearly full capacity mode for most of 2011. This led to nearly all of the recharge basins being at or near capacity for most of the 2011 season. When recharge was concluding late in the 2011 season, it was evident that abundant growth of vegetation within the recharge basins could be anticipated. KWBA was proactive in getting cattle onto drying basins as soon as conditions allowed for grazing without significant adverse effects from cattle through basin compaction or levee damage.

Most of the recharge areas were not able to have cattle turned out in any significant numbers until later in the season. As a result, there was still significant growth of vegetation in most areas even into the late fall as indicated in Photograph 1. Additionally, above-normal rains in October and November led to abundant new germination and early growth of vegetation as well. Cattle were increased on all areas of the KWB recharge in the late fall when conditions allowed. With most of the recharge basins still holding water at the end of the year, cattle grazing was primarily occurring within the Compatible Habitat areas in 2011 (Photograph 2).

Managing the vegetation within the Compatible Habitat areas is a challenge relative to managing the other areas on the KWB. This is especially true during, and just after, a period of recharge activities. The reason it is so challenging is that unlike the upland areas away from the recharge basins, the Compatible Habitat areas are profoundly affected by the input of water into the adjacent recharge basins and the resulting rising water table. Plants that are able to exploit this artificial input of water into the system such as bractscale (*Atriplex serenana*), five-hook bassia (*Bassia hyssopifolia*), annual sunflower (*Helianthus annuus*), and dock (*Rumex* spp.) can be very prolific and form nearly impenetrable stands (Photograph 3). Cattle grazing can be effective at helping to open such areas up, provided the cattle can be turned out onto these areas before they become so densely vegetated. Cattle will eat the younger growth of these species, but will tend to find other more palatable vegetation when these species get too mature and tough in texture. However, even when the vegetation has matured, cattle can still help to open the habitat through trampling and pulverizing of the vegetation.

Vegetation conditions in the Conservation Bank in 2011 led to cattle being turned out again in the South Area as was done in 2010. The primary goal of cattle grazing in the Conservation Bank is to manage the vegetation for special-status wildlife species such as Tipton kangaroo rats (*Dipodomys nitratooides nitratooides*), San Joaquin kit fox (*Vulpes macrotis mutica*), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), and burrowing owl (*Athene cunicularia*). It is also believed that managing for these species also benefits several other native wildlife species.

During a ten year study conducted from 1997-2006, Germano et al., (2012)¹ found that cattle grazing had no significant negative impacts on the native vertebrate species at a site in the Lokern Natural Area, and several species including short-nosed kangaroo rat (*D. n. brevinasus*), San Joaquin antelope squirrel, blunt-nosed leopard lizard (*Gambelia sila*) benefitted from carefully managed cattle grazing. In that study, which was the only long-term grazing study that has been conducted on these species and their habitats, the goal was to use cattle in years of abundant plant growth to graze the herbaceous cover down to approx. 500 lbs. per acre Residual Dry Matter (RDM) as soon as possible (e.g., April or May), and maintain that RDM for as long a duration as possible. SVB recommended following this strategy for the Conservation Bank lands in 2010 to the KWBA. The strategy has now been employed for the past two seasons in the South Area (Conservation Bank).

Photograph 4 illustrates the conditions within the South Area in late January of 2011. Abundant germination and growth of non-native grasses and forbs had already progressed to a point that necessitated turning cattle out earlier than was originally planned. Cattle were turned out in the South Area in February in an effort to begin managing the abundant growth. The target RDM (approx. 500 lbs. per acre), was reached in mid-July and the process of removing cattle from the South Area and onto

¹ Germano, D.J., G.B. Rathbun, and L.R. Saslaw. 2012. Effects of grazing and invasive grasses on desert vertebrates in California. *Journal of Wildlife Management* 76(4):670-682.

other areas of the KWB was initiated in late July and early August. Numerous active kangaroo rat burrows were observed during the third and fourth quarter monitoring visits to OMS 7 and other locations within the South Area in 2011. Photograph 5 illustrates the conditions observed in November 2011 at OMS 7.

The 2011 - 2012 rain season (October 1, 2011 – September 30, 2012) has been very dry to date, with only 73% of normal precipitation as of May 15, 2012. As a result, no cattle grazing has been prescribed for the Conservation Bank because RDM levels are either at or only slightly above the targeted 500 lbs. per acre for most areas. We will continue to monitor vegetation growth in the Conservation Bank, but given the rainy season is essentially complete, it is very unlikely that cattle grazing will be needed in the Conservation Bank in 2012.

The recharge areas, especially the Main, West, and Strand areas are currently being grazed in an effort to attempt to control abundant Russian thistle growth in some of the recharge basins and in the Compatible Habitat areas in the West and Strand areas. Unfortunately, although the 2011 - 2012 rain season has been dry, two strong storms in mid-April have appeared to result in significant growth of Russian thistle in many areas, especially in traditionally troublesome locations within the Strand, West, and James areas (Photograph 6). Unfortunately, the plants have grown rapidly and the cattle will probably only have a limited effect at thinning the plants before the plants become unpalatable. It is clear that while livestock grazing is the primary tool for managing vegetation on the KWB, it is also clear that its effectiveness can be limited in the highly variable and unpredictable nature of our climate, especially in regards to the amount and timing of seasonal precipitation.



Photograph 1. Area of Compatible Habitat within the Recharge Area on KWB on November 29, 2011. Note the abundant growth from the 2011 season and new growth from the significant early rains.



Photograph 2. Most of the recharge basins and canals were flooded in December 2011 and into 2012.



Photograph 3. Compatible Habitat area within the Main Area showing the effects of opportunistic plants such as five-hook bassia at exploiting the abundant shallow ground water adjacent to a recharge basin.



Photograph 4. Rapid germination and growth of herbaceous cover was observed in the South Area (Conservation Bank) in late January 2011. Cattle were turned out in February to begin to manage the abundant growth and begin the process of reducing cover to the target RDM of approx. 500 lbs. per acre.



Photograph 5. Vegetation conditions in the South Area in late November 2011. The new green growth was in response to significant early rainfall in October and November. Prior to this new growth, RDM was approx. 500-600 lbs. per acre.





Photograph 6. Rapidly growing Russian thistle plant in response to late season rains within the Strand Area. Photograph was taken on May 2, 2012. The plant is about 10 inches in height. Cattle will still eat plants at this developmental stage, but they will not seek it out as it is becoming unpalatable and there are more palatable species in the area.

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-1
 SECTION: 3
 TOWNSHIP/RANGE: 30S/25E
 COORDINATES (CA5-NAD83): 6181490, 2313744
 NUMBER OF ACRES: 40
 VEGETATION TYPE: EMERGENT WETLAND SPECIES PRESENT
 SITE TYPE: POND BASIN/POND LITTORAL ZONES

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	<p>SURVEY DATE: 02/14/2011 TIME: 10:00 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: SE WIND VELOCITY: 5 MPH TEMPERATURE: 60 F HUMIDITY: 42%</p> <p>NOTES: SEVERAL ACTIVE K-RAT BURROWS WILDLIFE PRESENT: GREAT BLUE HERON PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, CAPSELLA BURSA-PASTORIS, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, MALVA PARVIFLORA, PLAGIOBOTHRYSP., SALIX GOODDINGII, SENECIO VULGARIS, SISYMBRIUM IRIIO, VULPIA MYUROS</p>	NORTH	EAST	SOUTH	WEST
					
2ND QUARTER	<p>SURVEY DATE: 06/02/2011 TIME: 10:47 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 2 MPH TEMPERATURE: 62 F HUMIDITY: 31%</p> <p>NOTES: FLOODED WILDLIFE PRESENT: COMMON RAVEN PLANTS PRESENT: BROMUS RUBENS, JUNCUS BALTICUS, SALIX GOODDINGII, VULPIA MYUROS</p>	NORTH	EAST	SOUTH	WEST
					
3RD QUARTER	<p>SURVEY DATE: 09/26/2011 TIME: 12:15 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 5 MPH TEMPERATURE: 76 F HUMIDITY: 55%</p> <p>NOTES: FLOODED WILDLIFE PRESENT: BARN OWL, GREAT HORNED OWL PLANTS PRESENT: BROMUS RUBENS, CONYZA CANADENSIS, CYNODON DACTYLON, CYPERUS SP., ELEOCHARIS MACROSTACHYA, HELIANTHUS ANNUUS, LEPTOCHLOA UNINERVA, POLYPOGON MONSPELIENSIS, RUMEX CRISPUS, SALIX GOODDINGII, SOLANUM NIGRA, XANTHIUM STRUMARIAM</p>	NORTH	EAST	SOUTH	WEST
					
4TH QUARTER	<p>SURVEY DATE: 11/29/2011 TIME: 9:15 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 55 F HUMIDITY: 70%</p> <p>NOTES: FLOODED WILDLIFE PRESENT: WHITE-CROWNED SPARROW PLANTS PRESENT: BROMUS RUBENS, CYNODON DACTILION, JUNCUS BALTICUS, LACTUCA SALINA, RUMEX CRISPUS, SALIX GOODDINGII</p>	NORTH	EAST	SOUTH	WEST
					

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-2
SECTION: 9
TOWNSHIP/RANGE: 30S/25E
COORDINATES (CA5-NAD83): 6177540, 2308574
NUMBER OF ACRES: >1
VEGETATION TYPE: EMERGENT WETLAND SPECIES PRESENT/MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS
SITE TYPE: DITCH BANK/DITCH BOTTOM

SURVEY INFORMATION AND PHOTOGRAPHS

		NORTH	EAST	SOUTH	WEST
1ST QUARTER	<p> SURVEY DATE: 02/14/2011 TIME: 10:30 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: SE WIND VELOCITY: 3 MPH TEMPERATURE: 65 F HUMIDITY: 36% </p> <p> NOTES: DITCH BOTTOM STILL MOIST, NO VEGETATION GROWING WILDLIFE PRESENT: LOGGERHEAD SHRIKE PLANTS PRESENT: AMSINCKIA MENZIESII, BASSIA HYSSOPIFOLIA, BROMUS RUBENS, HIRSCHFELDIA INCANA, HORDEUM LEPORINUM, JUNCUS BALTICUS, LEYMUS TRITICOIDES, MELILOTUS INDICA, SALIX GOODDINGII, SENECIO VULGARIS, SISYMBRIUM IRIIO, SORGHUM HALEPENSES </p>				
2ND QUARTER	<p> SURVEY DATE: 06/02/2011 TIME: 11:03 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 5 MPH TEMPERATURE: 65 F HUMIDITY: 31% </p> <p> NOTES: FLOODED WILDLIFE PRESENT: COMMON RAVEN, WESTERN KINGBIRD PLANTS PRESENT: BASSIA HYSSOPIFOLIA, BROMUS RUBENS, HELIANTHUS ANNUUS, HELIOTROPIMUM CURASSAVICUM, HIRSCHFELDIA INCANA, SALIX GOODDINGII, SISYMBRIUM IRIIO </p>				
3RD QUARTER	<p> SURVEY DATE: 09/26/2011 TIME: 12:45 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: S WIND VELOCITY: 5 MPH TEMPERATURE: 80 F HUMIDITY: 35% </p> <p> NOTES: FLOODED AND MOSQUITO FISH PRESENT WILDLIFE PRESENT: BLACK PHOEBE, WHITE-FACED IBIS PLANTS PRESENT: BASSIA HYSSOPIFOLIA, CONYZA CANADENSIS, CONYZA COULTERI, HELIANTHUS ANNUUS, HELIOTROPIMUM CURASSAVICUM, LACTUCA SALINA, L. SERRIOLA, LEYMUS TRITICOIDES, POLYGONUM LAPHIFOLIUM, SALIX GOODDINGII, SORGHUM HALEPENSE </p>				
4TH QUARTER	<p> SURVEY DATE: 11/29/2011 TIME: 8:40 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 53 F HUMIDITY: 68% </p> <p> NOTES: FLOODED WILDLIFE PRESENT: CATTLE EGRET, MALLARD, WHITE-CROWNED SPARROW, WHITE-FACED IBIS PLANTS PRESENT: BASSIA HYSSOPIFOLIA, BROMUS RUBENS, CONYZA CANADENSIS, CONYZA COULTERI, ERODIUM CICUTARIUM, HELIANTHUS ANNUUS, HELIOTROPIMUM CURASSAVICUM, HIRSCHFELDIA INCANA, JUNCUS BALTICUS, LEYMUS TRITICOIDES, RUMEX CRISPIUS, SALIX GOODDINGII, SANCHUS OLERACEUS </p>				

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-3
SECTION: 10
TOWNSHIP/RANGE: 30S/25E
COORDINATES (CA5-NAD83): 6177656, 2311449
NUMBER OF ACRES: 80
VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/DOMINATED BY RUSSIAN THISTLE AND/OR PRICKLY LETTUCE
SITE TYPE: UPLAND-OLD FARM FIELD

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	SURVEY DATE: 02/14/2011 TIME: 10:20 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: SE WIND VELOCITY: 5 MPH TEMPERATURE: 60 F HUMIDITY: 41%	NORTH	EAST	SOUTH	WEST

NOTES: VEGETATION WILL NEED GRAZING IN A FEW WEEKS, ACTIVE K-RAT BURROWS, CALIFORNIA GROUND SQUIRREL BURROWS
WILDLIFE PRESENT: REDTAIL HAWK, WESTERN MEADOWLARK
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, LASTHENIA CALIFORNICA, SCHISMUS ARABICUS, SISYMBRIUM IRIO

2ND QUARTER	SURVEY DATE: 06/02/2011 TIME: 10:56 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 5 MPH TEMPERATURE: 66 F HUMIDITY: 33%	NORTH	EAST	SOUTH	WEST

NOTES: ACTIVE KANGAROO RAT BURROWS
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, SISYMBRIUM IRIO

3RD QUARTER	SURVEY DATE: 09/26/2011 TIME: 12:40 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 5 MPH TEMPERATURE: 77 F HUMIDITY: 34%	NORTH	EAST	SOUTH	WEST

NOTES: NUMEROUS KANGAROO RAT BURROWS, INCREASE GRAZING PRESSURE
WILDLIFE PRESENT: CALIFORNIA GROUND SQUIRREL, ROADRUNNER
PLANTS PRESENT: AMSINCKIA MENZIESII, BROUMUS RUBENS, SALSOLA TRAGUS, SISYMBRIUM IRIO

4TH QUARTER	SURVEY DATE: 11/29/2011 TIME: 9:05 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 52 F HUMIDITY: 70%	NORTH	EAST	SOUTH	WEST

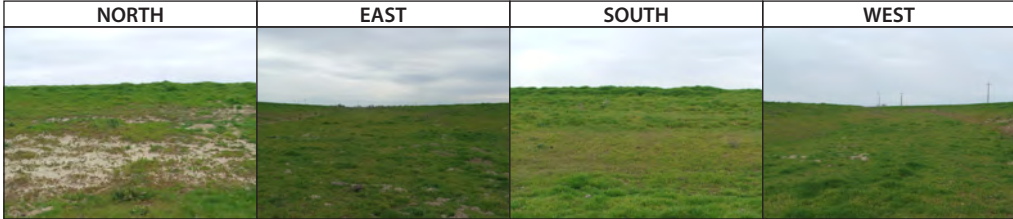
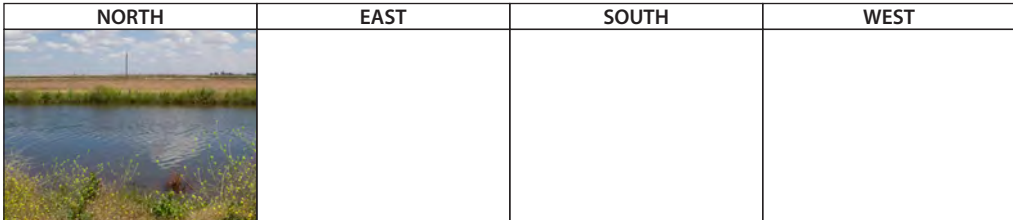
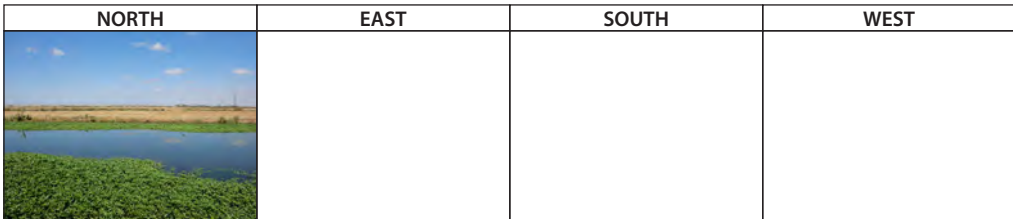
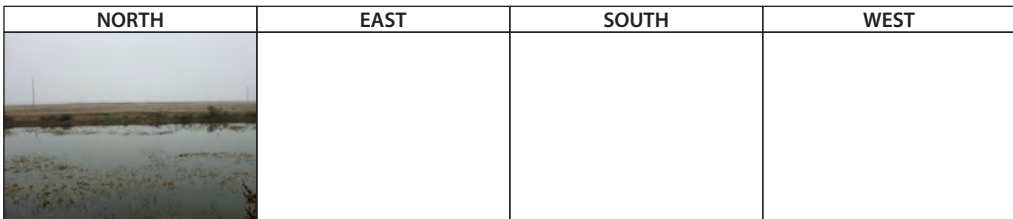
NOTES: SOME ACTIVE KANGAROO RAT BURROWS, GOOD GERMINATION OF HERBS, CATTLE GRAZING
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, SISYMBRIUM IRIO

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-4
 SECTION: 11
 TOWNSHIP/RANGE: 30S/25E
 COORDINATES (CA5-NAD83): 6186254, 2311943
 NUMBER OF ACRES: 10
 VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS
 SITE TYPE: DITCH BANK/DITCH BOTTOM

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	<p>SURVEY DATE: 02/14/2011 TIME: 11:32 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 63 F HUMIDITY: 35%</p> <p>NOTES: WILDLIFE PRESENT: CALIFORNIA GROUND SQUIRREL, GOPHER, LOGGERHEAD SHRIKE PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, HIRSCHFELDIA INCANA, RUMEX CRISPUS, SISYMBRIUM IRIO</p>	NORTH	EAST	SOUTH	WEST
					
2ND QUARTER	<p>SURVEY DATE: 06/02/2012 TIME: 11:41 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 2 MPH TEMPERATURE: 65 F HUMIDITY: 31%</p> <p>NOTES: FLOODED WILDLIFE PRESENT: COMMON RAVEN PLANTS PRESENT: AMSINCKIA MENZIESII, BROUMS RUBENS, SISYMBRIUM IRIO</p>	NORTH	EAST	SOUTH	WEST
					
3RD QUARTER	<p>SURVEY DATE: 09/26/2011 TIME: 1:23 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: S WIND VELOCITY: 3 MPH TEMPERATURE: 85 F HUMIDITY: 40%</p> <p>NOTES: FLOODED, WATER HYACYNTH WILDLIFE PRESENT: COMMON RAVEN, MALLARD, REDTAIL HAWK, TURKEY VULTURE PLANTS PRESENT: CONYZA CANADENSIS, CYPERIA SP., LUDWIGIA PEPLOIDES, RUMEX CRISPUS, XANTHIUM STRAMANTHIUM</p>	NORTH	EAST	SOUTH	WEST
					
4TH QUARTER	<p>SURVEY DATE: 11/29/2011 TIME: 9:30 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: W WIND VELOCITY: 2 MPH TEMPERATURE: 56 F HUMIDITY: 65%</p> <p>NOTES: FLOODED, WATER HYANCYNTH WILDLIFE PRESENT: AMERICAN COOTS PLANTS PRESENT: CONYZA CANADENSIS, HIRSCHFELDIA INCANA, LUDWIGIA PEPLOIDES, MALVA PARVIFLORA, RUMEX CRISPUS, XANTHIUM STRIMARIUM</p>	NORTH	EAST	SOUTH	WEST
					

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-5
SECTION: 7
TOWNSHIP/RANGE: 30S/26E
COORDINATES (CA5-NAD83): 6194387, 2306947
NUMBER OF ACRES: 50
VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS/RUDERAL VEGETATION
SITE TYPE: UPLAND-OLD FARM FIELDS

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	SURVEY DATE: 02/14/2011 TIME: 11:50 aM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 62 F HUMIDITY: 33%	NORTH	EAST	SOUTH	WEST

NOTES: ACTIVE KANGAROO RAT BURROWS
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS DIANDRUM, CRASSULA CONNATA, ERODIUM CICUTARIUM, GUILLENIA LASIOPHYLLA, SCHISMUS ARABICUS, VULPIA MICROSTACHYS

2ND QUARTER	SURVEY DATE: 06/02/2011 TIME: 12:16 PM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 3 MPH TEMPERATURE: 68 F HUMIDITY: 29%	NORTH	EAST	SOUTH	WEST

NOTES: KANGAROO RAT BURROWS
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, HIRSCHFELDIA INCANA, SISYMBRIUM IRIO, VULPIA MYUROS

3RD QUARTER	SURVEY DATE: 09/26/2011 TIME: 1:55 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: S WIND VELOCITY: 3 MPH TEMPERATURE: 84 F HUMIDITY: 37%	NORTH	EAST	SOUTH	WEST

NOTES: ACTIVE KANGAROO RAT BURROWS, NO TUMBLEWEED
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, SISYMBRIUM IRIO, VUPLIA MYUROS

4TH QUARTER	SURVEY DATE: 11/29/2011 TIME: 8:20 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: W WIND VELOCITY: 3 MPH TEMPERATURE: 54 F HUMIDITY: 70%	NORTH	EAST	SOUTH	WEST

NOTES: ACTIVE KANGAROO RAT BURROWS, ABUNDANT GERMINATION, CATTLE GRAZING
WILDLIFE PRESENT:
PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, STEPHANOMERIA PAUCIFLORA

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-6
SECTION: 36
TOWNSHIP/RANGE: 30S/25E
COORDINATES (CA5-NAD83): 6192992, 2287399
NUMBER OF ACRES: 160
VEGETATION TYPE: MIXED ANNUAL GRASSLAND WITH SCATTERED SHRUBS/SCATTERED SHRUBS-BARE SOIL
SITE TYPE: UPLAND-SENSITIVE HABITAT

SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	SURVEY DATE: 02/14/2011 TIME: 1:00 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: S WIND VELOCITY: 7 MPH TEMPERATURE: 69 F HUMIDITY: 32%	NORTH	EAST	SOUTH	WEST

NOTES: KANGAROO RAT BURROWS, AREA NEEDS GRAZING
WILDLIFE PRESENT: CALIFORNIA GROUND SQUIRREL, WHITE-CROWNED SPARROWS
PLANTS PRESENT: AMSINKIA MENZIESII, ATRIPLEX POLYCARPA, BROMUS RUBENS, LASTHENIA CALIFORNICA, LEPIDIUM NITICUM, PECTOCARYA PENNICILATA, PROSOPIS GLANDULOSA, VULPIA MICROSTACHYS, V. MYUROS

2ND QUARTER	SURVEY DATE: 06/22/2011 TIME: 9:40 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 96 F HUMIDITY: 28%	NORTH	EAST	SOUTH	WEST

NOTES: KANGAROO RAT BURROWS, DENSE VEGETATION
WILDLIFE PRESENT: WHITE-CROWNED SPARROWS
PLANTS PRESENT: AMSINCKIA MENZIESII, ATRIPLEX POLYCARPA, BROMUS RUBENS, ERODIUM CICUTARIUM, LASTHENIA CALIFORNICA, LEPIDIUM NITIDUM, PROSOPIS GLANDULOSA, SISYMBRIUM IRIO

3RD QUARTER	SURVEY DATE: 09/26/2011 TIME: 2:07 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 85 F HUMIDITY: 37%	NORTH	EAST	SOUTH	WEST

NOTES: ACTIVE KANGAROO RAT BURROWS, ACTIVE BURROWING OWL DEN 30 FEET SOUTHEAST OF OMS STATION
WILDLIFE PRESENT: BURROWING OWL
PLANTS PRESENT: AMSINCKIA MENZIESII, ATRIPLEX POLYCARPA, BROMUS HORDEACEUS, B. RUBENS, PROSOPIS GLANDULOSA, VULPIA MYUROS

4TH QUARTER	SURVEY DATE: 11/29/2011 TIME: 8:00 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: W WIND VELOCITY: 3 MPH TEMPERATURE: 55 F HUMIDITY: 68%	NORTH	EAST	SOUTH	WEST




NOTES: ACTIVE KANGAROO RAT BURROWS, ABUNDANT GERMINATION
WILDLIFE PRESENT: WHITE-CROWNED SPARROWS
PLANTS PRESENT: AMSINCKIA MENZIESII, ATRIPLEX POLYCARPA, BROMUS RUBENS, ERODIUM CICUTARIUM, PROSOPIS GLANDULOSA

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS





LOCATION INFORMATION

LOCATION: OMS-7
 SECTION: 34
 TOWNSHIP/RANGE: 30S/25E
 COORDINATES (CA5-NAD83):612246, 2290740
 NUMBER OF ACRES: 160
 VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS
 SITE TYPE: UPLAND-SENSITIVE HABITAT/UPLAND-OLD FARM FIELDS





SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	SURVEY DATE: 02/14/2011 TIME: 1:22 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: SE WIND VELOCITY: 3 MPH TEMPERATURE: 61 F HUMIDITY: 36%	NORTH	EAST	SOUTH	WEST
					





NOTES: ACTIVE KANGAROO RAT BURROWS AND CALIFORNIA GROUND SQUIRREL BRROWS, GRAZING NEEDED-MARCH
 WILDLIFE PRESENT:
 PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, CAPSELLA BURSA-PASTORIS, ERODIUM CICUTARIUM, GUILLENIA LASIOPHYLLA, LASTHENIA CALIFORNICA, SISYMBRIUM IRIO

2ND QUARTER	SURVEY DATE: 06/02/2011 TIME: 1:22 PM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 70 F HUMIDITY: 31%	NORTH	EAST	SOUTH	WEST
					

NOTES: KANGAROO RAT BURROWS
 WILDLIFE PRESENT: COMMON RAVEN
 PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM, LASTHENIA CALIFORNICA, SCHISMUS ARABICUS, SISYMBRIUM IRIO

3RD QUARTER	SURVEY DATE: 09/26/2011 TIME: 2:30 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: W WIND VELOCITY: 3 MPH TEMPERATURE: 85 F HUMIDITY: 33%	NORTH	EAST	SOUTH	WEST
					

NOTES: ACTIVE KANGAROO RAT BURROWS
 WILDLIFE PRESENT:
 PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS

4TH QUARTER	SURVEY DATE: 11/29/2011 TIME: 7:30 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: W WIND VELOCITY: 2 MPH TEMPERATURE: 50 F HUMIDITY: 72%	NORTH	EAST	SOUTH	WEST
					

NOTES: NUMEROUS KANGAROO RAT BURROWS, ABUNDANT GERMINATION OF GRASSES, SEVERAL OTHER GERMINATING HERBS
 WILDLIFE PRESENT: COMMON RAVEN, WHITE-CROWNED SPARROW
 PLANTS PRESENT: AMSINCKIA MENZIESII, BROMUS RUBENS, ERODIUM CICUTARIUM

KERN WATER BANK 2011 VEGETATION MONITORING PROGRAM SITE OBSERVATIONS

LOCATION INFORMATION

LOCATION: OMS-8
 SECTION: 16
 TOWNSHIP/RANGE: 30S/25E
 COORDINATES (CA5-NAD83): 6173009, 2307209
 NUMBER OF ACRES: 40
 VEGETATION TYPE: MOSTLY DOMINATED BY ANNUAL GRASSES AND WEEDS/NON-NATIVE PLANTS
 SITE TYPE: POND BASIN

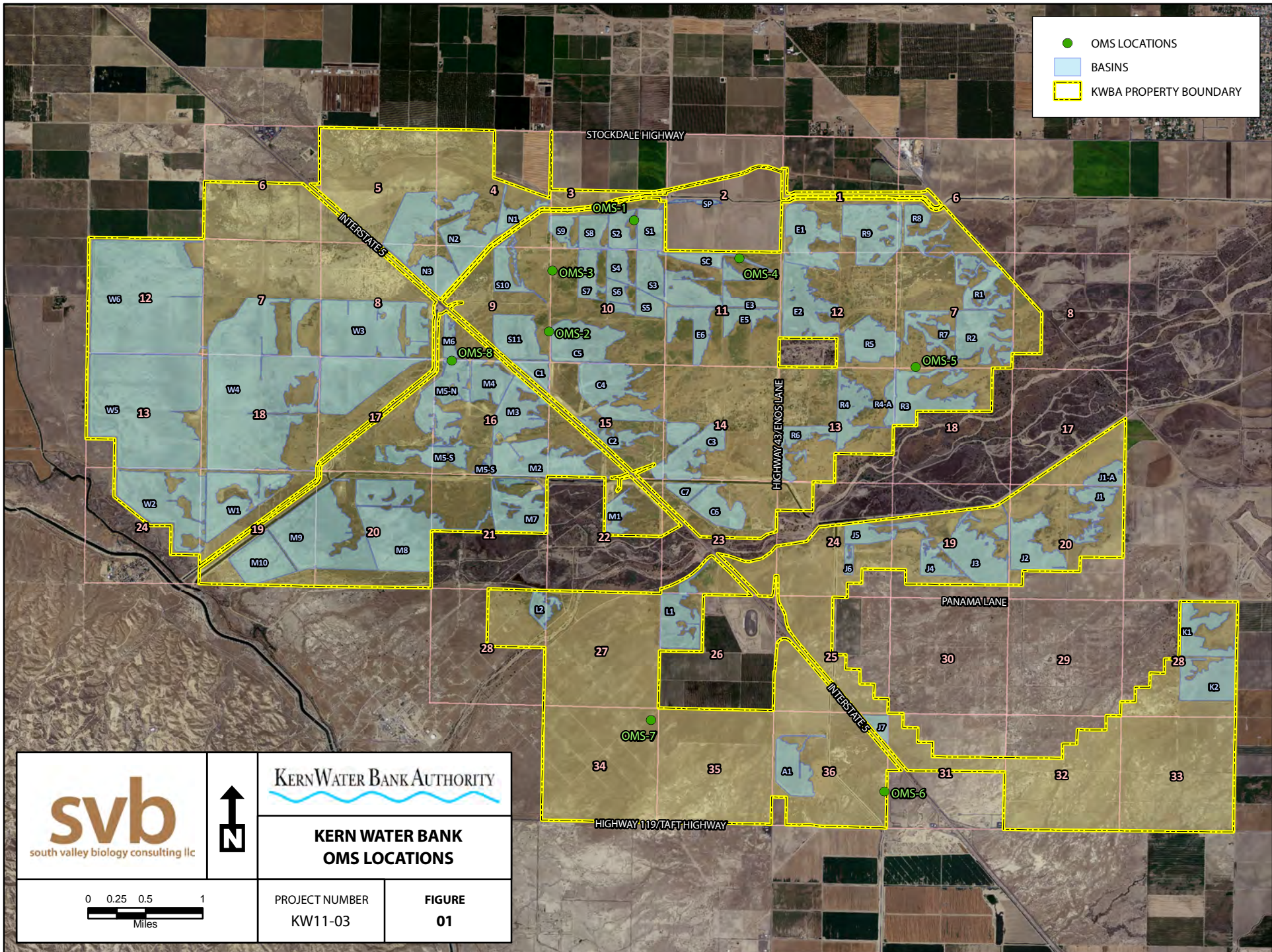
SURVEY INFORMATION AND PHOTOGRAPHS

1ST QUARTER	SURVEY DATE: 02/14/2011 TIME: 10:50 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 0.89 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 61 F HUMIDITY: 31%	NORTH	EAST	SOUTH	WEST
	NOTES: RECENTLY FLOODED, NO VEGETATION PRESENT WILDLIFE PRESENT: BREWER'S BLACKBIRD, LOGGERHEAD SHRIKE, REDWING BLACKBIRD, TRI-COLORED BLACKBIRD, TURKEY VULTURE PLANTS PRESENT: SALIX GOODDINGII, XANTHIUM STREMARUM				

2ND QUARTER	SURVEY DATE: 06/02/2011 TIME: 11:11 AM MONITOR(S): J. KANG RAINFALL TO DATE: 3.08 IN WIND DIRECTION: NW WIND VELOCITY: 2 MPH TEMPERATURE: 64 F HUMIDITY: 33%	NORTH	EAST	SOUTH	WEST
	NOTES: FLOODED WILDLIFE PRESENT: PLANTS PRESENT: SALIX GOODDINGII, SISYMBRIUM IRIO, TYPHA LATIFOLIA				

3RD QUARTER	SURVEY DATE: 09/26/2011 TIME: 12:55 PM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 3.08 IN WIND DIRECTION: N WIND VELOCITY: 5 MPH TEMPERATURE: 78 F HUMIDITY: 43%	NORTH	EAST	SOUTH	WEST
	NOTES: FLOODED WILDLIFE PRESENT: AMERICAN COOT, COMMON MERGANSER, REDWING BLACKBIRD, WESTERN MEADOWLARK PLANTS PRESENT: CONYZA CANADENSIS, CYPREUS SP., HELIANTHUS ANNUUS, LACTUCA SERRIOLA, LEYMUS TRITICOIDES, LUDWIGIA PEPLOIDES, LYTHRUM CALIFORNICUM, PHALA NODIFLORA, SALIX GOODDINGII, TYPHA LATIFOLIA				

4TH QUARTER	SURVEY DATE: 11/29/2011 TIME: 9:00 AM MONITOR(S): J. JONES, S. JONES RAINFALL TO DATE: 4.39 IN WIND DIRECTION: WIND VELOCITY: 0 MPH TEMPERATURE: 54 F HUMIDITY: 72%	NORTH	EAST	SOUTH	WEST
	NOTES: FLOODED WILDLIFE PRESENT: AMERICAN COOT, AMERICAN KESTREL, MALLARD, NIGHT HERON, NORTHERN SHOVELER, RED-TAIL HAWK PLANTS PRESENT: ACROPTILON REPENS, BROMUS RUBENS, CONYZA CANADENSIS, HELIANTHUS ANNUUS, HELIOTROPIUM CURASSAVICUM, HIRSCHFELDIA INCANA, LACTUCA SERRIOLA, LUDWIGIA PEPLOIDES, LYTHRUM CALIFORNICUM, RUMEX CRISPIUS, SALIX GOODDINGII, TYPHA LATIFOLIA				



- OMS LOCATIONS
- BASINS
- KWBA PROPERTY BOUNDARY



KERN WATER BANK AUTHORITY

**KERN WATER BANK
OMS LOCATIONS**

PROJECT NUMBER
KW11-03

FIGURE
01

